

# ***Interactive comment on “Application of locality principle to radio occultation studies of the Earth’s atmosphere and ionosphere” by A. G. Pavelyev et al.***

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This discussion paper summarises several important consequences of the application of the locality principle to the RO sensing technique. First, a new formulation of the locality principle which establishes the relation of the eikonal acceleration and refractive attenuation of the RO signal is introduced. Then, four important findings of applying locality principle are described and discussed, respectively, i.e. calculation of the signal absorption, estimation of the location and inclination of ionospheric layers, detection of small-scale irregularities contributions in the RO signal, and a new index for the ionospheric activity. In all, the locality principle has greatly broaden the potential of RO

signal in the atmospheric and ionospheric structures study.

The paper is well written, and the research questions are clearly defined and appropriately answered. A few recommendations are given in the following:

01. The chapter "Conclusions" is a mixture of introduction, abstract, and conclusions. Please do not repeat the backgrounds and focus more on the significance of the principle of locality in atmosphere detection as well as limitations of the study. In addition, I am also interested in the authors' future plan about this research, since the principle of locality has shown such extensive geophysical applications.

02. Page 739, line 20: "Principle of locality remained unknown for 45 years radio occultation studies of the atmosphere and ionosphere of the Earth and planets." I think this claim is a little exaggerated. According to the references given in this manuscript, the locality principle and similar theories that are also the basis of the locality principle have been studied and applied to RO signal process by a few researchers during the last decade.

03. Some of the references that are quoted in the manuscript are not found in the References section. For example, Pavelyev et al., 2000, 2012 (page 724, line 21), Pavelyev et al., 2012b (page 724, line 26), Pavelyev, 2008, 2013 (page 725, line 3), Pavelyev et al., 2010, 2012, 2013 (page 725, line 3).

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